WHAT IS CLAIMED IS:

1. A method of identifying a noise environment in which a noisy input signal was generated, the method comprising:

identifying frames of the noisy input signal;

generating a noisy input feature vector for the signal in each frame; and

for each frame, making a separate identification of a noise environment in which the noisy input feature vector for the current frame was generated based on the noisy input feature vector.

2. The method of claim 1 wherein identifying a noise environment comprises determining a probability of each of a set of environments based in part on the noisy input feature vector.

3. The method of claim 2 wherein determining a probability of an environment comprises determining a filtered probability of an environment for a current frame based in part on the probability of the environment for at least one previous frame.

4. The method of claim 3 wherein determining the filtered probability of an environment for a current frame comprises:

determining an unfiltered probability of the environment based on the current noisy input feature vector;

determining the probability of the environment based on at least one previous noisy input feature vector;

applying weights to the probabilities to form weighted probabilities; and

combining the weighted probabilities to determine the filtered probability of the environment for the current frame.

5. The method of claim 4 wherein identifying a noise environment further comprises comparing the probability of each environment for the current frame and selecting the most probable environment as the identified noise environment.

6. The method of claim 4 wherein identifying a noise environment further comprises:

for each noise environment, counting the number of frames in a set of previous frames in which the noise environment had the highest filtered probability; and

selecting the noise environment with the highest count as the identified noise environment for the current frame.

7. The method of claim 3 wherein identifying a noise environment further comprises:

for each noise environment, counting the number of frames in a set of previous frames in which the noise environment was the most probable noise environment; and

selecting the noise environment with the highest count as the identified noise environment for the current frame.

8. The method of claim 2 wherein determining a probability for an environment comprises determining the distance between the input noisy feature vector and a codeword associated with the environment.

9. The method of claim 8 wherein determining a probability for an environment further comprises determining the distribution of a set of noisy training feature vectors associated with the codeword.

10. The method of claim 9 wherein the noisy training feature vectors are formed by modifying clean training feature vectors.

11. The method of claim 10 wherein modifying clean training feature vectors comprises:

convolving the clean training feature vectors with a set of channel

distortion feature vectors to produce distorted training feature vectors; and

adding additive noise feature vectors to the distorted training feature vectors to produce the noisy training feature vectors.

12. The method of claim 1 further comprising identifying a correction vector to apply to the noisy input feature vector to produce a clean feature vector based in part on the identified environment.

13. The method of claim 12 wherein identifying a correction vector comprises:

determining which of a set of codewords associated with the identified environment is closest to the noisy input feature vector; and

selecting a correction vector associated with the closest codeword.

14. The method of claim 13 wherein determining which of a set of codewords associated with the identified environment is closest comprises:

dividing a feature vector space associated with the environment into sub-spaces by sequentially dividing the feature vector space using a set of boundary conditions; and

comparing the noisy input feature vectors with at least some of the boundary conditions to identify the closest codeword in the environment.

15. The method of claim 12 wherein the clean feature vector is a clean training feature vector.

16. The method of claim 15 wherein the clean training feature vector is used to construct a model for pattern recognition.

17. The method of claim 12 wherein the clean feature vector is a clean input feature vector.

18. The method of claim 17 wherein the clean input feature vector is applied to a pattern recognition model to identify a pattern.

19. A computer-readable medium having computer-executable instructions for identifying a noise environment from sections of a noisy speech signal that are smaller than an utterance through steps comprising:

identifying at least one feature of each section;

making a separate determination of the noise environment for each section based on the at least one feature.

20. The computer-readable medium of claim 19 wherein making a separate determination of the noise environment comprises determining a probability of each of a set of possible environments.

21. The computer-readable medium of claim 20 wherein determining a probability of an environment for a section comprises determining a filtered probability for the section, the filtered probability based on the probability of the environment for multiple sections.

22. The computer-readable medium of claim 21 wherein determining a filtered probability comprises:

determining a probability of the environment for a current section;

determining the probability of the environment for a past section;

weighting the probability for the current section to form a weighted current probability;

weighting the probability for the past section to form a weighted past probability; and

combining the weighted current probability and the weighted past probability to form the filtered probability.

23. The computer-readable medium of claim 22 wherein making a separate determination of the noise environment comprises:

for each environment, counting the number of past sections in which the environment had the highest filtered probability; and

determining that the noise environment with the highest count is the noise environment of the current section.

24. The computer-readable medium of claim 20 wherein making a separate determination of the noise environment further comprises:

determining a probability for each environment for each of a set of sections;

for each environment, counting the number of sections in the set of sections in which the environment had the highest probability; and

determining that the noise environment with the highest count is the noise environment of a current section.

25. The computer-readable medium of claim 20 wherein determining a probability comprises determining a distribution of noisy training feature vectors associated with an environment.

26. The computer-readable medium of claim 25 wherein the noisy training feature vectors are formed by modifying clean training feature vectors.

27. The computer-readable medium of claim 26 wherein modifying clean training feature vectors comprises:

applying a channel distortion function to the clean training feature vectors to form distorted feature vectors; and

adding noise feature vectors to the distorted feature vectors to produce the noisy training feature vectors.

28. The computer-readable medium of claim 19 wherein identifying at least one feature comprises identifying a noisy feature vector and wherein the computer-executable instructions further provide for performing a step of identifying a correction vector to apply to the noisy feature vector to form a clean feature vector based on the environment determined for the section.

29. The computer-readable medium of claim 28 wherein identifying a correction vector comprises:

grouping a collection of noisy training feature vectors into mixture components;

identifying a codeword for each mixture component;

identifying which codeword from the set of codewords that are associated with the designated environment is closest to the noisy feature vector for the section; and

selecting a correction vector associated with the closest codeword.

30. The computer-readable medium of claim 28 wherein the clean feature vector is used to train a model.

31. The computer-readable medium of claim 28 wherein the clean feature vector is applied to a model to identify a speech unit.

32. The computer-readable medium of claim 19 wherein the computer-executable instructions further provide for performing a step of setting a confidence measure based on the determination of the noise environment.